FROEHLING & ROBERTSON, INC.
Engineering Stability Since 1881

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October 16, 2017 (revised February 5, 2018)

North Carolina Department of Transportation
Geotechnical Engineering Unit
1020 Birch Ridge Drive
Raleigh, North Carolina 27610

Attn.: Mr. Gordon Box, L.G.
GeoEnvironmental Project Manager

Re: State Project: R-2530B
WBS Element: 34446.1.6
NC 24-27 from Bird Road in Albemarle to West of the Pee Dee River

Subject: **Preliminary Site Assessment**
Parcel #051 – Gary J & Nancy L Deeck (Deeck Mechanical, Inc.)
2218 East Main Street
Albemarle, North Carolina
F&R Project #66V-0092

Dear Mr. Box:

Froehling and Robertson, Inc. (F&R) has completed the authorized Preliminary Site Assessment at the Gary J & Nancy L Deeck property located in Albemarle, North Carolina. The work was performed in general accordance with F&R's Proposal No. 1866-00132, dated June 14, 2017 (and revised June 22, 2017). Notice to Proceed was issued to F&R on July 6, 2017. This report documents our field activities, presents the results of laboratory analysis and provides estimated quantities of petroleum impacted soils.

Please do not hesitate to contact us if you should have any questions regarding this report.

Sincerely,

FROEHLING & ROBERTSON, INC.

DocuSigned by:
4DB7F275EBFD410...

Clint E. Sorrell
Environmental Scientist

DocuSigned by:
Benjamin A. Whitley
E425D6E8C23545B...

NORTH CAROLINA PROFESSIONAL SEAL 038743 ENGINEER BENJAMIN A. WHITLEY

Benjamin A. Whitley, P.E.
GeoEnvironmental Services Manager

FROEHLING & ROBERTSON, INC.

PRELIMINARY SITE ASSESSMENT

Gary J & Nancy L Deeck (Parcel #051)
Deeck Mechanical, Inc.
2218 East Main Street
Albemarle, North Carolina
State Project: R-2530B
WBS Element: 34446.1.6
F&R Project #66V-0092

October 16, 2017 (revised February 5, 2018)

Prepared for:

North Carolina Department of Transportation
Geotechnical Engineering Unit
1020 Birch Ridge Drive
Raleigh, NC 27610

TABLE OF CONTENTS

Preliminary Site Assessment Report
Gary J & Nancy L Deeck Property (Parcel #051)
Albemarle, Stanly County, North Carolina
F&R Project No. 66V-0092

1.0 Introduction

Froehling and Robertson, Inc. (F&R) has prepared this Preliminary Site Assessment (PSA) Report to document soil assessment activities performed at the Gary J & Nancy L Deeck Property addressed as 2218 East Main Street, in Albemarle, Stanly County, North Carolina. The site is located approximately 350 feet west of the East Main Street and Anderson Road intersection as shown in Appendix I, Figures 1 and 2. As indicated in the Request for Technical and Cost Proposal (RFTCP), the site operates as an existing heating/air mechanical store (Deeck Mechanical). According to the NCDEQ UST Section Registry, the site formerly operated as a gas station and convenience store. One UST was removed in 1992, and five additional USTs were removed in 2003.

According to the NCDOT within their RFTCP, acquisition of right-of-way is necessary for the proposed NC 24-27 design. As such, the NCDOT requested a PSA be performed to assess the possibility of encountering petroleum impacted soil from known or unknown USTs, and to locate USTs which may exist within proposed easements and right-of-way at the project site.

The PSA was performed in general accordance with F&R's Proposal No. 1866-00132, dated June 14, 2017 (and revised June 22, 2017) with Notice to Proceed issued to F&R by the NCDOT on July 6, 2017. The purpose of this report is to document field activities, present the results of laboratory analysis, and provide estimated quantities of petroleum impacted soils.

The existing on-site structure is one-story in height and of brick construction. As requested by NCDOT, F&R accessed the building interior. Evidence of floor drains or in-ground lifts was not observed. The remainder of the site consists of an asphalt, paved and gravel surfaced parking lot and cleared/wooded land. The site is bordered to the north by East Main Street; to the south by wooded land and scattered residential development; to the east by a residential structure; and to the west by a storage/tool shop. Access to the site is gained from East Main Street to the north.

2.0 Geophysical Survey

Prior to F&R's soil assessment activities, Pyramid Environmental & Engineering, P.C. (Pyramid) conducted a geophysical survey to locate suspect metal underground storage tanks (USTs). The geophysical work was conducted on July 24, 2017, and was performed within the proposed utility easement (PUE) of East Main Street.

The geophysical investigation consisted of electromagnetic (EM) induction surveys using a Geonics EM61 instrument. Ground-penetrating radar (GPR) investigations of selected EM61 anomalies were investigated using a Geophysical Survey Systems UtilityScan DF unit equipped with a dual frequency 300/800 MHz antenna. The EM61 data was collected along parallel survey lines spaced approximately 5 feet apart. The data was reviewed in the field to evaluate the possible presence of USTs and later transferred to a desktop computer for further review. Data was collected over most of the planned survey site with the exception of areas immediately adjacent to metallic objects and other obstacles. Isolated EM anomalies were identified on the site, including vehicles and a building.

Based on the EM and GPR geophysical data collected at the site, Pyramid observed two anomalies that were interpreted to be the results of one probable metallic UST within about 3 feet of the ground surface and one possible metallic UST within about 2 feet of the ground surface. The complete geophysical report is attached as Appendix II.

3.0 Site Assessment Activities

F&R visited the site on August 10, 2017 to perform the Preliminary Site Assessment. The assessment consisted of advancing 7 borings into the soils at the project site using direct-push technology (GeoProbe). The boring locations were determined by F&R staff based on the results of the geophysical survey, site features and proposed construction activities. Three of the borings (B-1 through B-3) were advanced on the northern portion of the site adjacent to East Main Street. Borings B-4 through B-7 were advanced just east of the on-site building, adjacent to one probable and one possible metallic UST. F&R attempted to advance the borings adjacent to East Main Street (B-1 through B-3) to the proposed depth of 10 feet below ground surface (bgs) and the borings around the USTs to the proposed depth of 12 feet bgs. However, Boring B-1 was terminated at a depth of 7 feet bgs and Borings B-4, B-6, and B-7 were terminated at depths ranging from 6 to 11 feet bgs, where GeoProbe refusal was encountered. Photos detailing existing site features are attached as Appendix III and boring locations are depicted in Figure 3 of this report.

Soil sample cores from the borings were collected in disposable, 4-foot long acetate sleeves. The soil samples were visually/manually classified and screened in the field using a calibrated photo-ionization detector (PID) for evidence of petroleum hydrocarbons. Evaluation of VOC concentrations were performed using a MiniRae 3000 PID which produces results in parts per million (ppm). A representative soil sample was collected from two foot sections of each sleeve and placed in a re-sealable plastic bag. The vapors were then allowed to equilibrate in the headspace of the bag for approximately ten minutes prior to measurement with the PID. The measurements were collected by placing the probe tip into the headspace of the bag. PID measurements can be found in the GeoProbe Logs in Appendix IV, as well as in Table 1 in Section 5.0 below.

Generally, the soil sample in each boring which exhibited the highest PID concentration was submitted for laboratory analysis for diesel range organics (DRO), gasoline range organics (GRO), Total BTEX (benzene, toluene, ethylbenzene and xylenes), 16 PAHs (polycyclic aromatic hydrocarbons) and BaP (Benzo(a)pyrene) by Ultraviolet Fluorescence (UVF) technology (RedLab QED Hydrocarbon Analyzer).

The samples were collected in laboratory-supplied sample containers, placed in a cooler with ice, and shipped via UPS to RedLab in Wilmington, North Carolina following standard chain-of custody procedures.

4.0 Subsurface Conditions

As indicated in the attached GeoProbe Logs (Appendix IV), subsurface conditions from existing ground surface to boring termination primarily included various layers of dry to moist, red-orange-brown-tan silty sandy clay, dry, tan, silty fine-medium sand, dry gray-tan silt, and dry tan/gray silt with gravel. F&R attempted to advance the borings adjacent to East Main Street (B-1 through B-3) to the proposed depth of 10 feet below ground surface (bgs) and the borings around the USTs to the proposed depth of 12 feet bgs. However, Boring B-1 was terminated at a depth 7 feet bgs and Borings B-4, B-6, and B-7 were terminated at depths ranging from 6 to 11 feet bgs, where GeoProbe refusal was encountered in interbedded layers of dense silt and gravel.

PID readings generally ranged from 0.8 to 7.3 ppm. However, elevated PID readings (9.5 to 21.5 ppm) and petroleum odors were encountered at boring location B-6 from 6 to 10 feet bgs. Groundwater was not observed during field screening or sample collection activities.

5.0 Analytical Results

As shown in the following table, petroleum hydrocarbons identified as GRO were encountered in the soil samples at three boring locations advanced at the site (B-4, B-6, and B-7), at depths from 2 to 4 feet bgs (B-4 and B-7) to 6 to 8 feet bgs (B-6). The laboratory results indicate that the GRO concentrations ranged from 1.1 mg/kg (B-4) to 16 mg/kg (B-6), which are below the UST Section Action Level of 50 mg/kg.

Petroleum hydrocarbons identified as DRO were encountered in the soil samples at the seven boring locations advanced at the site (B-1 through B-7), at depths from 0 to 2 feet bgs (B-5) to 6 to 8 feet bgs (B-6). The laboratory results indicate that the DRO concentrations ranged from 3.3 mg/kg (B-1) to 64.1 mg/kg (B-3), which are below the UST Section Action Level of 100 mg/kg.

The laboratory analytical results indicate concentrations of the sum of 16 EPA PAHs above the method detection limit, but below the total NCDEQ Action Level of 9,068.816 mg/kg at Borings B-3, B-4, B-6, and B-7. The soil analytical results are summarized in Table 1 below. The laboratory analytical results can also be found in the attached Appendix V of this report.

Table 1
Soil Sampling Analytical Results

Sample ID	Sample Date	Sample Depth (ft bgs)	PID Reading (ppm)	GRO (mg/kg)	DRO (mg/kg)	TPH (mg/kg)	Total BTEX (mg/kg)	Total Aromatics (mg/kg)	16 EPA PAHs (mg/kg)	BaP (mg/kg)
B-1	8/10/17	6-7	4.9	<0.89	3.3	3.3	<0.89	2	<0.28	<0.036
B-2		2-4	5.5	<1	4	4	<1	3.3	<0.32	<0.04
B-3		2-4	4.4	<1	64.1	64.1	<1	50.4	2.5	<0.056
B-4		4-6	4.9	1.1	15.2	16.3	<0.93	7.5	0.38	<0.037
B-5		0-2	7.3	<0.92	5.6	5.6	<0.92	3	<0.29	<0.037
B-6		6-8	21.5	16	36.8	52.8	<1.1	13.3	0.5	<0.043
B-7		2-4	5.8	2.1	12.5	14.6	<0.97	10.6	0.57	<0.039
NCDEQ Action Level				**50**	**100**	**NSE**	**13.8056**	**NSE**	**9,068.816**	**0.088**

Concentrations shown in bold exceed the NCDEQ Action Level as outlined in the NCDEQ, DWM, UST Section Guidelines
ppm = parts per million
GRO = Gasoline Range Organics
DRO = Diesel Range Organics
TPH = Total Petroleum Hydrocarbons
BTEX = Benzene, Toluene, Ethylbenzene and Xylenes
NSE = No Standard Exists

6.0 Conclusions and Recommendations

F&R conducted a PSA at the Gary J & Nancy L Deeck Property addressed as 2218 East Main Street, in Albemarle, Stanly County, North Carolina. A geophysical investigation was performed by Pyramid Environmental & Engineering to investigate the presence and location of USTs in the proposed easements and right-of-way. Based on the results of the geophysical survey, it was determined that one probable and one possible metallic UST were located just east of the on-site building. F&R recommends that USTs removed from the project site be properly managed and disposed of in accordance with NCDEQ rules and regulations.

Seven GeoProbe borings were advanced during the assessment within the PUE where grading activities are proposed in association with the NC 24-27 improvements. Based on the results of laboratory testing and observed PID readings, petroleum impacted soils were encountered in the vicinity of boring locations B-1 through B-7. Laboratory analysis detected concentrations of DRO at these locations, as well as GRO at boring locations B-4, B-6, and B-7; however, the concentrations of these compounds were below the NCDEQ Action Levels of 100 mg/kg DRO and 50 mg/kg GRO.

It should be noted that a delineation of the soil contamination was not performed, as this was not included in the proposed scope of work. The above conclusions are based on interpretations of soil analytical results, PID readings and our experience with petroleum UST releases.

7.0 Limitations

These services have been performed, under authorization of the North Carolina Department of Transportation for specific application on this project. These services have been performed in accordance with generally accepted environmental and hydrogeological practices. No other warranty, expressed or implied is made. As with any subsurface investigation, actual conditions exist only at the precise locations from which samples were taken. Certain inferences are based on the results of sampling and related testing to form a professional opinion of conditions in areas beyond those from which samples were taken. Our conclusions and recommendations are based upon information provided to us by others, our sampling and testing results and our site observations. We have not verified the completeness or accuracy of the information provided by others, unless otherwise noted. Our observations are based upon conditions readily visible at the site at the time of our site visits.

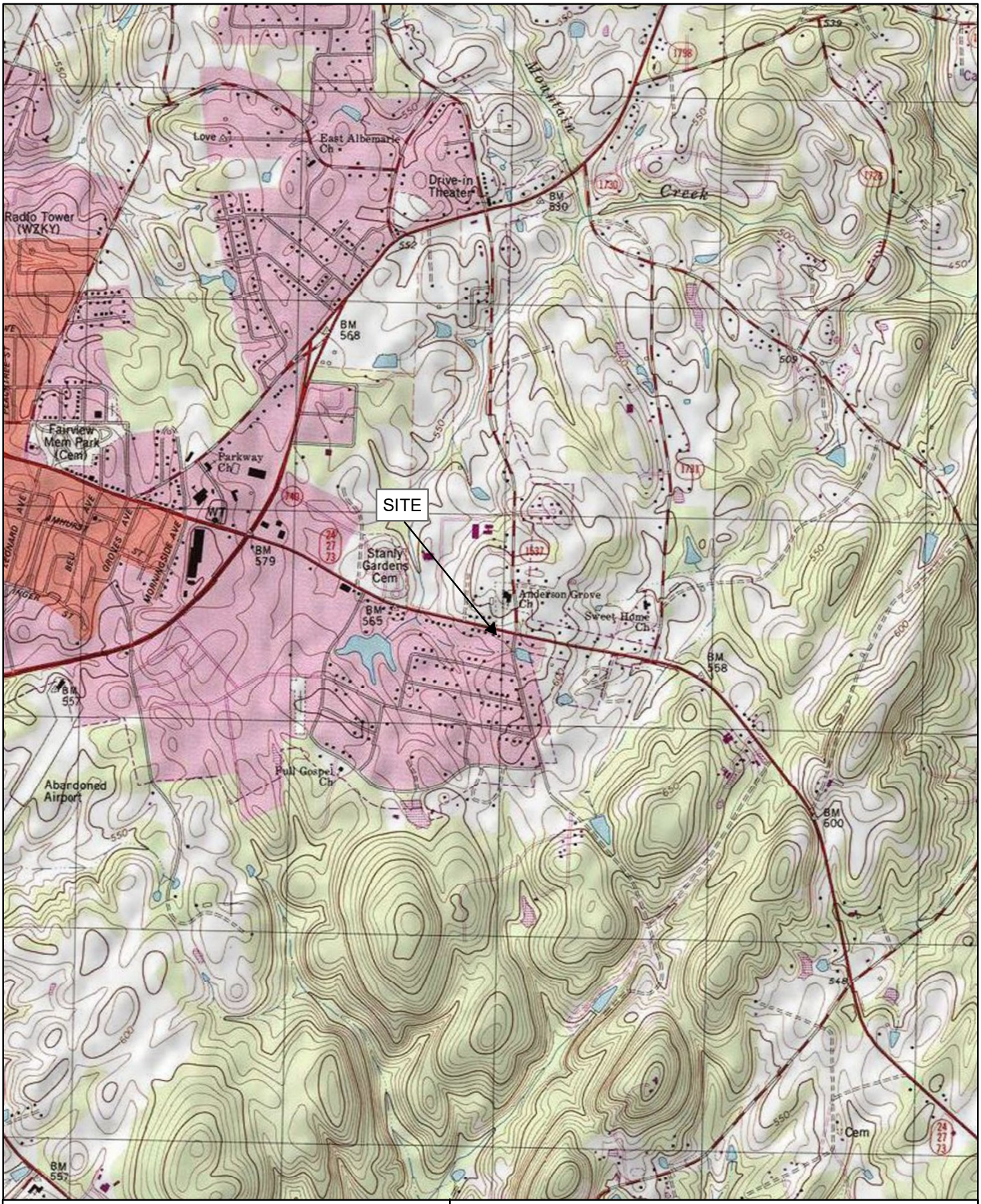
Froehling & Robertson, Inc. by virtue of providing the services described in this report, does not assume the responsibility of the person(s) in charge of the site, or otherwise undertake responsibility for reporting to any local, state or federal public agencies any conditions at the site that may present a potential danger to public health, safety or the environment. In areas that require notification of local, state, or federal public agencies as required by law, it is the Client's responsibility to so notify.

APPENDIX I

Figure No. 1 – TOPOGRAPHIC MAP

Figure No. 2 – SITE VICINITY MAP

Figure No. 3 – LABORATORY RESULTS & BORING LOCATION PLAN



SITE TOPOGRAPHIC MAP

0 1,000 2,000 4,000 6,000 Feet

N

SINCE F&R 1881

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Client:	NCDOT
Project:	R-2530B PSAs
Location:	Parcel #051, Albemarle, NC
F&R Project No.:	66V-0092 2218 East Main Street - Albemarle, North Carolina
Data:	USGS 2013
Date:	October 2017 (Revised Feb. 5, 2018) Scale: 1:24,000 1 inch = 2,000 feet

Disclaimer: F&R makes no warranties or guarantees regarding the accuracy or completeness of geographic features shown on this map. Spatial accuracy of measurement provided by source agencies can be obtained by contacting F&R.

FIGURE No.: 1

SITE VICINITY MAP

0 100 200 400 600 Feet

N

SINCE F&R 1881

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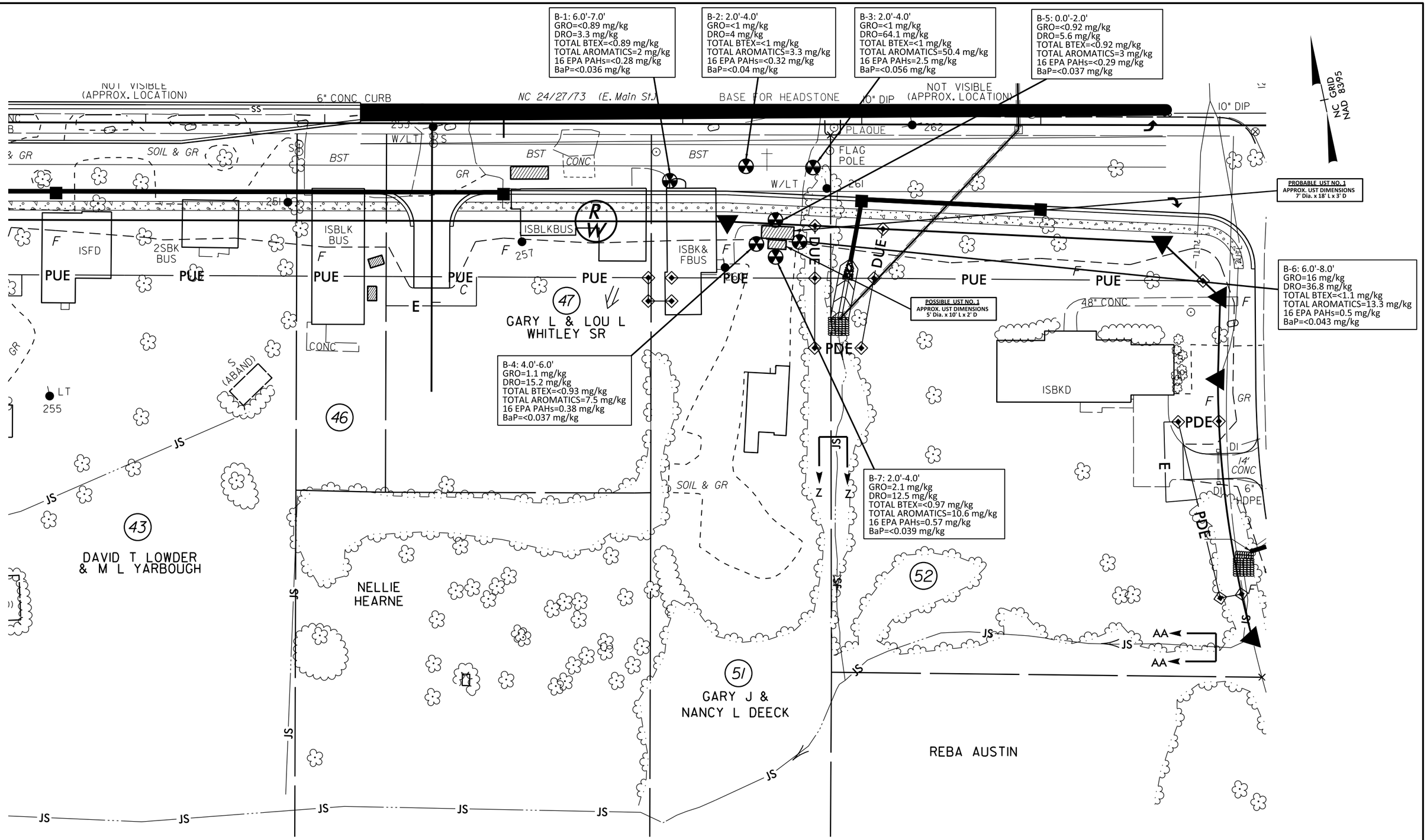
Client:	NCDOT
Project:	R-2530B PSAs
Location:	Parcel #051, Albemarle, NC
F&R Project No.:	66V-0092
Data:	ArcMap Imagery
Date:	October 2017 (Revised Feb. 5, 2018)

Disclaimer: F&R makes no warranties or guarantees regarding the accuracy or completeness of geographic features shown on this map. Spatial accuracy of measurement provided by source agencies can be obtained by contacting F&R.

2218 East Main Street - Albemarle, North Carolina

Scale: 1:2,400 1 inch = 200 feet

FIGURE No.: 2



SCALE (FEET)
0 25' 50'
1"=50'

SINCE 1881

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LEGEND

Approximate Geoprobe Boring Location

Sample data shown in bold exceed the NCDEQ Action Level as outlined in the NCDEQ DWM UST Section Guidance

LABORATORY RESULTS & BORING LOCATION PLAN

CLIENT: NCDOT		
PROJECT: R-2530B PSAs		
LOCATION: Albemarle, NC Parcel #051, 2218 East Main Street		
F&R PROJECT No.: 66V-0092		FIGURE No.: 3
DRAWN BY: T. T. Walker	CHECKED BY: B. Whitley, P.E.	
DATE: February 2018	SCALE: 1"=50'	

APPENDIX II

GEOPHYSICAL REPORT PREPARED BY PYRAMID

PYRAMID GEOPHYSICAL SERVICES
(PROJECT 2017-203)

GEOPHYSICAL SURVEY

METALLIC UST INVESTIGATION:
PARCEL 051
NCDOT PROJECT R-2530B

2218 E. MAIN STREET, ALBEMARLE, NC

AUGUST 31, 2017

Report prepared for: **Benjamin Whitley, P.E.**
Froehling and Robertson
310 Hubert Street
Raleigh, North Carolina 27603

Prepared by: _____
Eric C. Cross, P.G.
NC License #2181

Reviewed by: _____
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GEOPHYSICAL INVESTIGATION REPORT
Parcel 051 – 2218 E. Main Street
Albemarle, Stanly County, North Carolina

Table of Contents

Figures

LIST OF ACRONYMS

CADD .....Computer Assisted Drafting and Design
DF .....Dual Frequency
EM.....Electromagnetic
GPR.....Ground Penetrating Radar
GPS .....Global Positioning System
NCDOT.....North Carolina Department of Transportation
ROW .....Right-of-Way
UST .....Underground Storage Tank

EXECUTIVE SUMMARY

Project Description: Pyramid Environmental conducted a geophysical investigation for Froehling and Robertson, Inc. (F&R) at Parcel 051, located at 2218 E. Main Street, Albemarle, NC. The survey was part of a North Carolina Department of Transportation (NCDOT) Right-of-Way (ROW) investigation (NCDOT Project R-2530B). F&R directed Pyramid as to the geophysical survey boundaries at the project site, which were designed to extend from the existing edge of pavement to the proposed ROW lines and/or easement lines within the property, whichever distance was greater. Conducted on July 24, 2017, the geophysical investigation was performed to determine if unknown, metallic underground storage tanks (USTs) were present beneath the survey area.

Geophysical Results: The geophysical investigation consisted of an electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys. A total of four EM anomalies were identified. Several of the EM anomalies were directly attributed to visible cultural features at the ground surface. One EM feature was associated with unknown buried metal, and was investigated further by GPR. GPR provided evidence of two isolated hyperbolic reflectors and two discreet lateral reflectors that are characteristic of USTs. The combined geophysical data resulted in this feature being classified as one probable and one possible metallic UST. The probable metallic UST was approximately 18 feet long and 7 feet wide at a depth of approximately 3 feet below the ground surface (center point 1656290.83, 582516.19 North Carolina State Plane NAD83, feet). The possible metallic UST was approximately 10 feet long and 5 feet wide at a depth of approximately 2 feet below the ground surface (center point 1656289.38, 582509.60 North Carolina State Plane NAD83, feet).

Collectively, the geophysical data recorded evidence of one probable and one possible metallic UST at Parcel 051.

INTRODUCTION

Pyramid Environmental conducted a geophysical investigation for Froehling and Robertson, Inc. (F&R) at Parcel 051, located at 2218 E. Main Street, Albemarle, NC. The survey was part of a North Carolina Department of Transportation (NCDOT) Right-of-Way (ROW) investigation (NCDOT Project R-2530B). F&R directed Pyramid as to the geophysical survey boundaries at the project site, which were designed to extend from the existing edge of pavement to the proposed ROW lines and/or easement lines within the property, whichever distance was greater. Conducted on July 24, 2017, the geophysical investigation was performed to determine if unknown, metallic underground storage tanks (USTs) were present beneath the survey area.

The site included a commercial building surrounded by an asphalt parking area and grass medians. An aerial photograph showing the survey area boundaries and ground-level photographs are shown in **Figure 1**.

FIELD METHODOLOGY

The geophysical investigation consisted of an electromagnetic (EM) induction-metal detection and ground penetrating radar (GPR) surveys. Pyramid collected the EM data using a Geonics EM61 metal detector integrated with a Trimble AG-114 GPS antenna. The integrated GPS system allows the location of the instrument to be recorded in real-time during data collection, resulting in an EM data set that is geo-referenced and can be overlain on aerial photographs and CADD drawings. A boundary grid was established around the perimeter of the site with marks every 10 feet to maintain orientation of the instrument throughout the survey and assure complete coverage of the area.

According to the instrument specifications, the EM61 can detect a metal drum down to a maximum depth of approximately 8 feet. Smaller objects (1-foot or less in size) can be detected to a maximum depth of 4 to 5 feet. The EM61 data were digitally collected at approximately 0.8-foot intervals along north-south trending or east-west trending,

generally parallel survey lines, spaced five feet apart. The data were downloaded to a computer and reviewed in the field and office using the Geonics NAV61 and Surfer for Windows Version 14.0 software programs.

GPR data were acquired across select EM anomalies on July 24, 2017, using a Geophysical Survey Systems, Inc. (GSSI) UtilityScan DF unit equipped with a dual frequency 300/800 MHz antenna. Data were collected both in reconnaissance fashion as well as along formal transect lines across EM features. The GPR data were viewed in real-time using a vertical scan of 512 samples, at a rate of 48 scans per second. GPR data were viewed down to a maximum depth of approximately 6 feet, based on dielectric constants calculated by the DF unit in the field during the reconnaissance scans. GPR transects across specific anomalies were saved to the hard drive of the DF unit for post-processing and figure generation.

Pyramid's classifications of USTs for the purposes of this report are based directly on the geophysical UST ratings provided by the NCDOT. These ratings are as follows:

Geophysical Surveys for Underground Storage Tanks
on NCDOT Projects

High Confidence	Intermediate Confidence	Low Confidence	No Confidence
Known UST Active tank - spatial location, orientation, and approximate depth determined by geophysics.	**Probable UST** Sufficient geophysical data from both magnetic and radar surveys that is characteristic of a tank. Interpretation may be supported by physical evidence such as fill/vent pipe, metal cover plate, asphalt/concrete patch, etc.	**Possible UST** Sufficient geophysical data from either magnetic or radar surveys that is characteristic of a tank. Additional data is not sufficient enough to confirm or deny the presence of a UST.	Anomaly noted but not characteristic of a UST. Should be noted in the text and may be called out in the figures at the geophysicist's discretion.

DISCUSSION OF RESULTS

Discussion of EM Results

A contour plot of the EM61 results obtained across the survey area at the property is presented in **Figure 2**. Each EM anomaly is numbered for reference in the figure. The

following table presents the list of EM anomalies and the cause of the metallic response, if known:

LIST OF METALLIC ANOMALIES IDENTIFIED BY EM SURVEY

Metallic Anomaly #	Cause of Anomaly	Investigated with GPR
1	Vehicles	
2	Building	
3	**One probable & one possible UST**	☑
4	Vehicle	

Several of the EM anomalies were directly attributed to visible cultural features including vehicles and the building. However, EM Anomaly 3 was observed to be an isolated high-amplitude feature that was not directly attributed to visible objects at the ground surface. This feature was investigated further by GPR.

Discussion of GPR Results

Figure 3 presents the locations of the formal GPR transects performed at the property, as well as the transect images. A total of four GPR transects were performed at the site. The four transects showed two isolated hyperbolic reflectors and two discreet lateral reflectors that are characteristic of metal USTs. Transects 1 and 2 recorded relatively clear and consistent reflectors, while Transects 3 and 4 recorded somewhat disrupted and down-warped reflectors. For these reasons, the combined EM and GPR data resulted in this feature being classified as one probable and one possible UST. The probable UST was approximately 18 feet long and 7 feet wide at a depth of approximately 3 feet below the ground surface (center point 1656290.83, 582516.19 North Carolina State Plane NAD83, feet). The possible UST was approximately 10 feet long and 5 feet wide at a depth of approximately 2 feet below the ground surface (center point 1656289.38, 582509.60 North Carolina State Plane NAD83, feet).

Figure 4 presents the locations of the probable and possible USTs on an aerial photograph along with a ground-level photograph.

Collectively, the geophysical data recorded evidence of one probable and one possible metallic UST at Parcel 051.

Figure 5 provides the UST locations and an overlay of the geophysical survey area onto the NCDOT MicroStation engineering plans (proposed ROW and easements) for reference.

SUMMARY & CONCLUSIONS

Pyramid's evaluation of the EM61 and GPR data collected at Parcel 051 in Albemarle, North Carolina, provides the following summary and conclusions:

- The EM61 and GPR surveys provided reliable results for the detection of metallic USTs within the accessible portions of the geophysical survey area.
- Several of the EM anomalies were directly attributed to visible cultural features at the ground surface.
- One EM feature was associated with unknown buried metal, and was investigated further by GPR.
- GPR provided evidence of two isolated hyperbolic reflectors and two discreet lateral reflectors that are characteristic of USTs. The combined geophysical data resulted in this feature being classified as one probable and one possible metallic UST.
- The probable metallic UST was approximately 18 feet long and 7 feet wide at a depth of approximately 3 feet below the ground surface (center point 1656290.83, 582516.19 North Carolina State Plane NAD83, feet).
- The possible metallic UST was approximately 10 feet long and 5 feet wide at a depth of approximately 2 feet below the ground surface (center point 1656289.38, 582509.60 North Carolina State Plane NAD83, feet).
- Collectively, the geophysical data recorded evidence of one probable and one possible metallic UST at Parcel 051.

LIMITATIONS

Geophysical surveys have been performed and this report was prepared for F&R in accordance with generally accepted guidelines for EM61 and GPR surveys. It is generally recognized that the results of the EM61 and GPR surveys are non-unique and may not represent actual subsurface conditions. The EM61 and GPR results obtained for this project have not conclusively determined the definitive presence or absence of metallic USTs, but the evidence collected is sufficient to result in the conclusions made in this report. Additionally, it should be understood that areas containing extensive vegetation, reinforced concrete, or other restrictions to the accessibility of the geophysical instruments could not be fully investigated.

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APPROXIMATE BOUNDARIES OF GEOPHYSICAL SURVEY AREA

View of Survey Area
(Facing Approximately Southeast)

View of Survey Area
(Facing Approximately East)

TITLE
PARCEL 051 - GEOPHYSICAL SURVEY
BOUNDARIES AND SITE PHOTOGRAPHS

PROJECT
PARCEL 051
ALBEMARLE, NORTH CAROLINA
NCDOT PROJECT R-2530B

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License # C1251 Eng. / License # C257 Geology

DATE 8/24/2017

CLIENT
FROEHLING & ROBERTSON

PYRAMID PROJECT #: 2017-203

FIGURE 1

N

EM61 METAL DETECTION RESULTS

EVIDENCE OF ONE PROBABLE AND ONE POSSIBLE METALLIC UST OBSERVED.

The contour plot shows the differential results of the EM61 instrument in millivolts (mV). The differential results focus on larger metallic objects such as USTs and drums. The EM61 data were collected on July 24, 2017, using a Geonics EM61 instrument. Verification GPR data were collected on July 24, 2017, using a GSSI UtilityScan DF unit with a dual frequency 300/800 MHz antenna.

EM61 Metal Detection Response (millivolts)

TITLE
PARCEL 051 -
EM61 RESULTS CONTOUR MAP

PROJECT
PARCEL 051
ALBEMARLE, NORTH CAROLINA
NCDOT PROJECT R-2530B

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License # C1251 Eng. / License # C257 Geology

DATE 8/24/2017

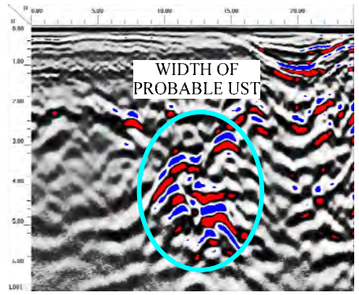
CLIENT
FROEHLING & ROBERTSON

PYRAMID PROJECT #: 2017-203

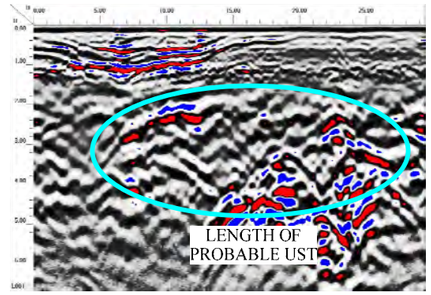
FIGURE 2

N

GPR TRANSECT LOCATIONS



GPR TRANSECT 1 (T1)



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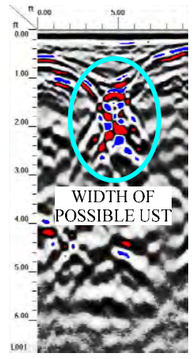
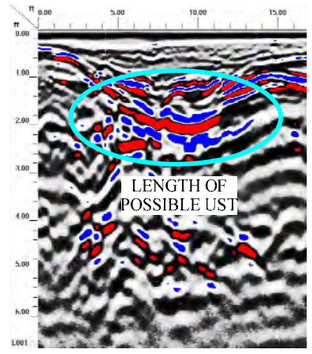


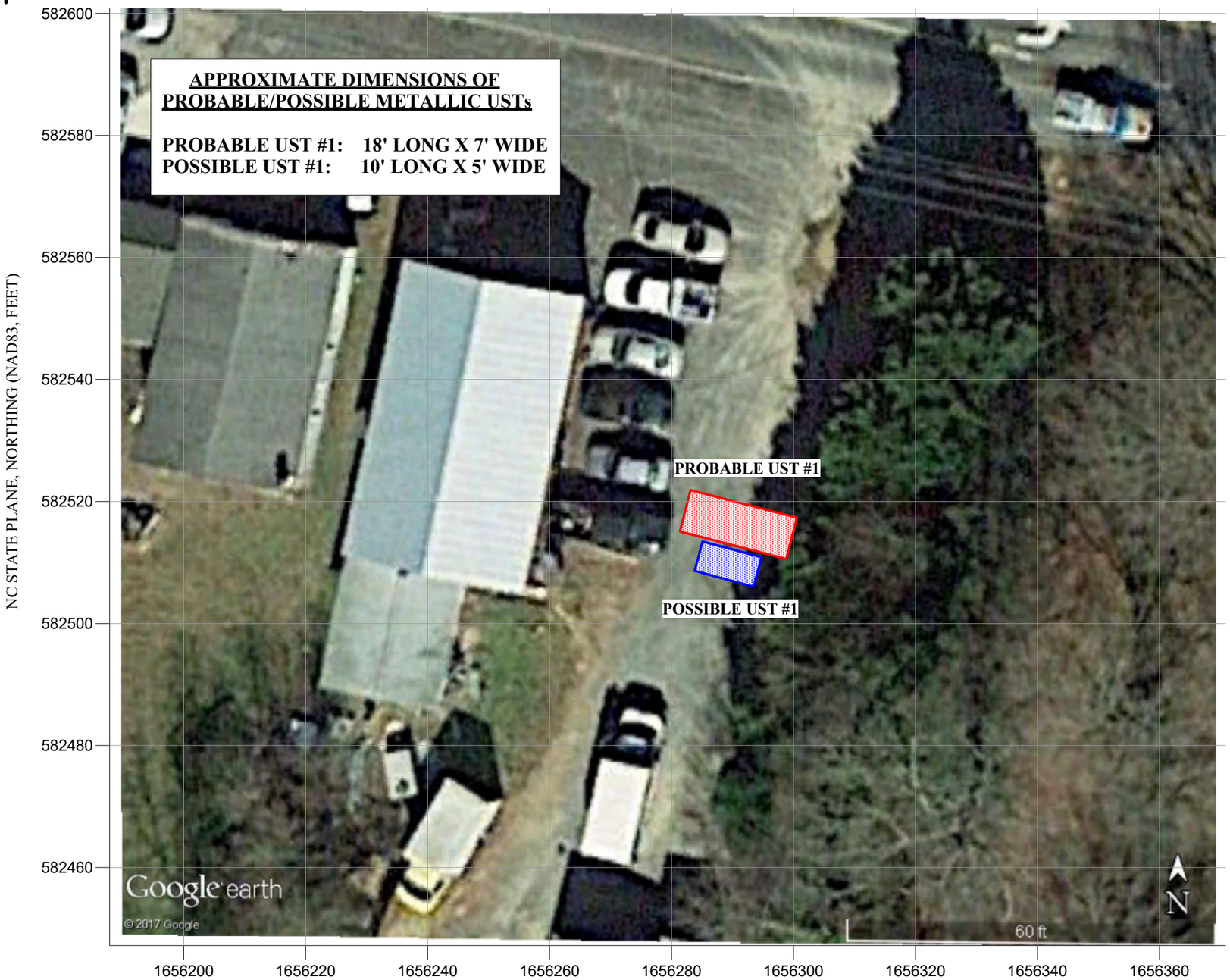
GPR TRANSECT 3 (T3)

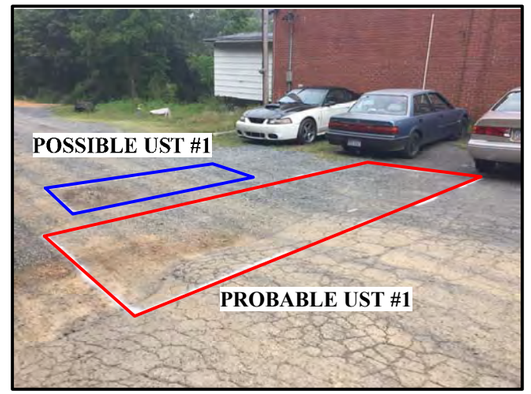


GPR TRANSECT 4 (T4)

TITLE	PARCEL 051 - GPR TRANSECT LOCATIONS AND IMAGES
PROJECT	PARCEL 051 ALBEMARLE, NORTH CAROLINA NCDOT PROJECT R-2530B
PYRAMID GEOPHYSICS	503 INDUSTRIAL AVENUE GREENSBORO, NC 27460 (336) 335-3174 (p) (336) 691-0648 (f) License # C1251 Eng. / License # C257 Geology
DATE: 8/24/2017	CLIENT: FROEHLING & ROBERTSON
PYRAMID PROJECT #: 2017-203	**FIGURE 3**

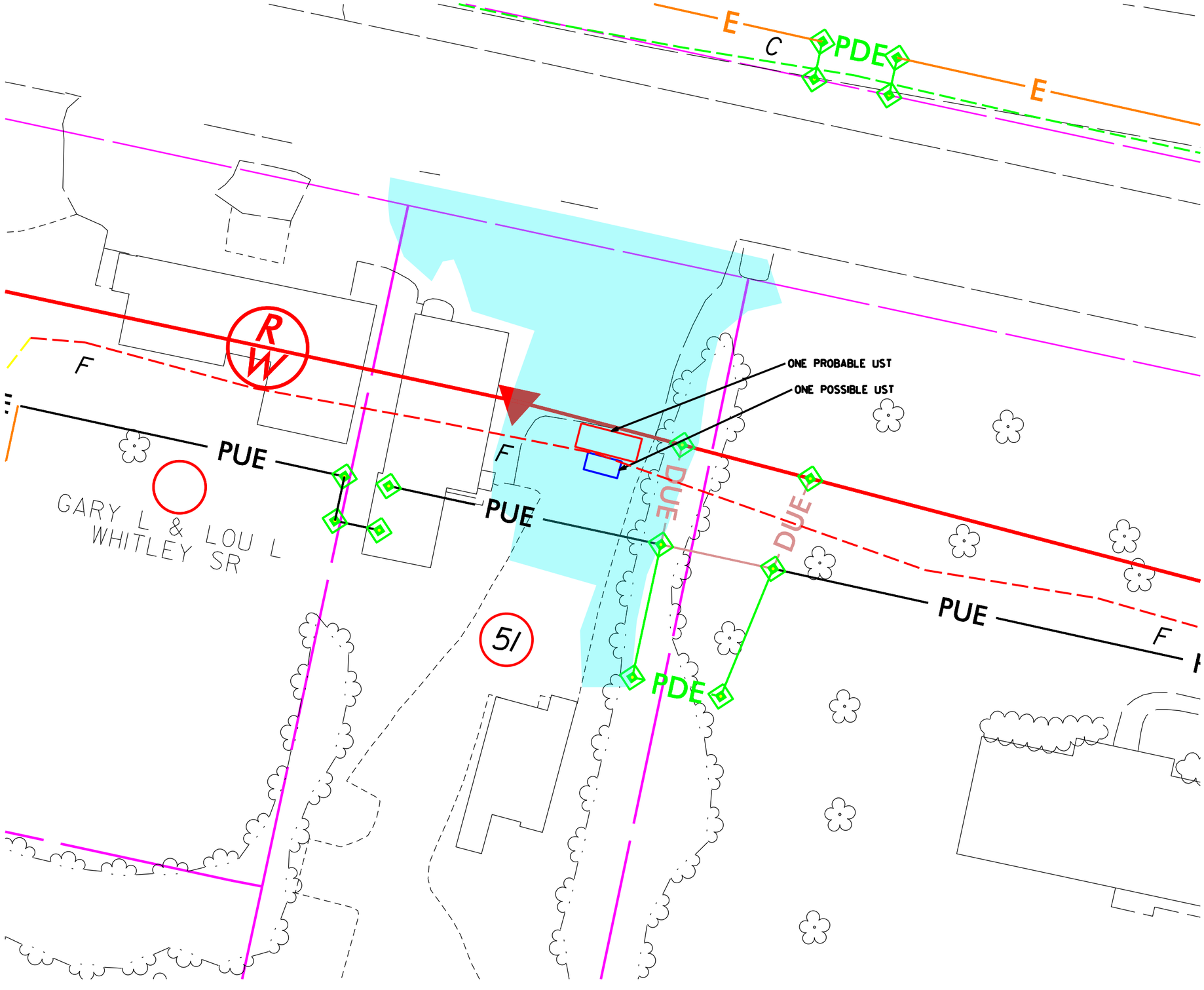
LOCATION OF PROBABLE/POSSIBLE METALLIC USTs





View of Probable UST #1
and Possible UST #1
Facing Approximately South

TITLE	PARCEL 051 - LOCATIONS AND SIZES OF PROBABLE/POSSIBLE USTs
PROJECT	PARCEL 051 ALBEMARLE, NORTH CAROLINA NCDOT PROJECT R-2530B
PYRAMID GEOPHYSICS	503 INDUSTRIAL AVENUE GREENSBORO, NC 27460 (336) 335-3174 (p) (336) 691-0648 (f) License # C1251 Eng. / License # C257 Geology
DATE 8/3/2017	CLIENT FROEHLING & ROBERTSON
PYRAMID PROJECT #: 2017-203	**FIGURE 4**



LEGEND

- EXISTING ROW
- EXISTING PROPERTY BOUNDARY
- PROPOSED ROW LINE
- TEMPORARY CONSTRUCTION EASEMENT
- PROPOSED PERMANENT DRAINAGE
- PROPOSED PERMANENT UTILITY
- PROPOSED SS CUT LINE
- PROPOSED SS FILL LINE
- GEOPHYSICAL SURVEY AREA
- PROBABLE METALLIC UST
- POSSIBLE METALLIC UST

0 15 30
FEET

N

TITLE OVERLAY OF GEOPHYSICAL SURVEY BOUNDARIES AND LOCATIONS OF PROBABLE/POSSIBLE USTs ON NCDOT ENGINEERING PLANS

PROJECT
PARCEL 051
ALBEMARLE, NORTH CAROLINA
NCDOT PROJECT R-2530B

PYRAMID GEOPHYSICS
503 INDUSTRIAL AVENUE
GREENSBORO, NC 27406
336.335.3174 (p) 336.691.0648 (f)
License # C1251 Eng. / #C257 Geology

DATE: 8-24-17	REVISION NO. 0
PYRAMID PROJECT NO. 2017-203	FIGURE NO. 5

APPENDIX III

SITE PHOTOS

Photo #1: Boring location B-1, facing south.

Photo #2: Boring locations B-2 and B-3, facing east.

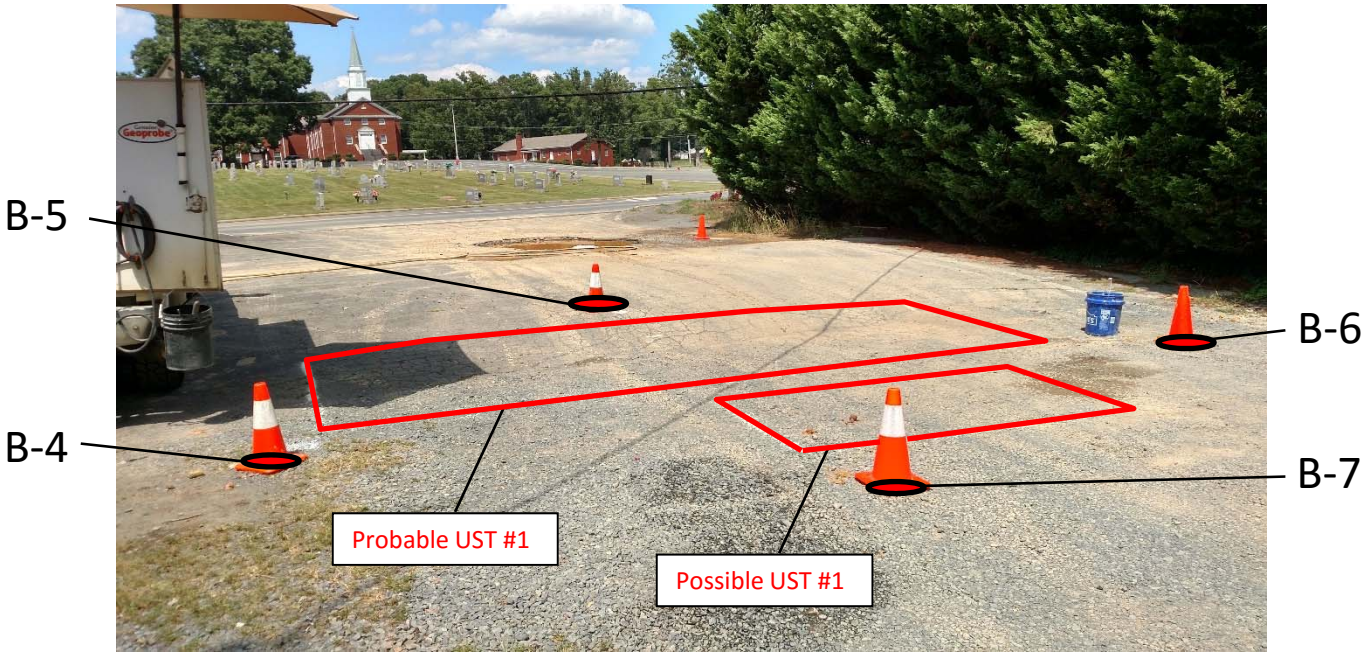


Photo #3: Boring locations B-4, B-5, B-6, B-7, surrounding the probable and possible UST, located just east of the on-site structure, facing northeast.

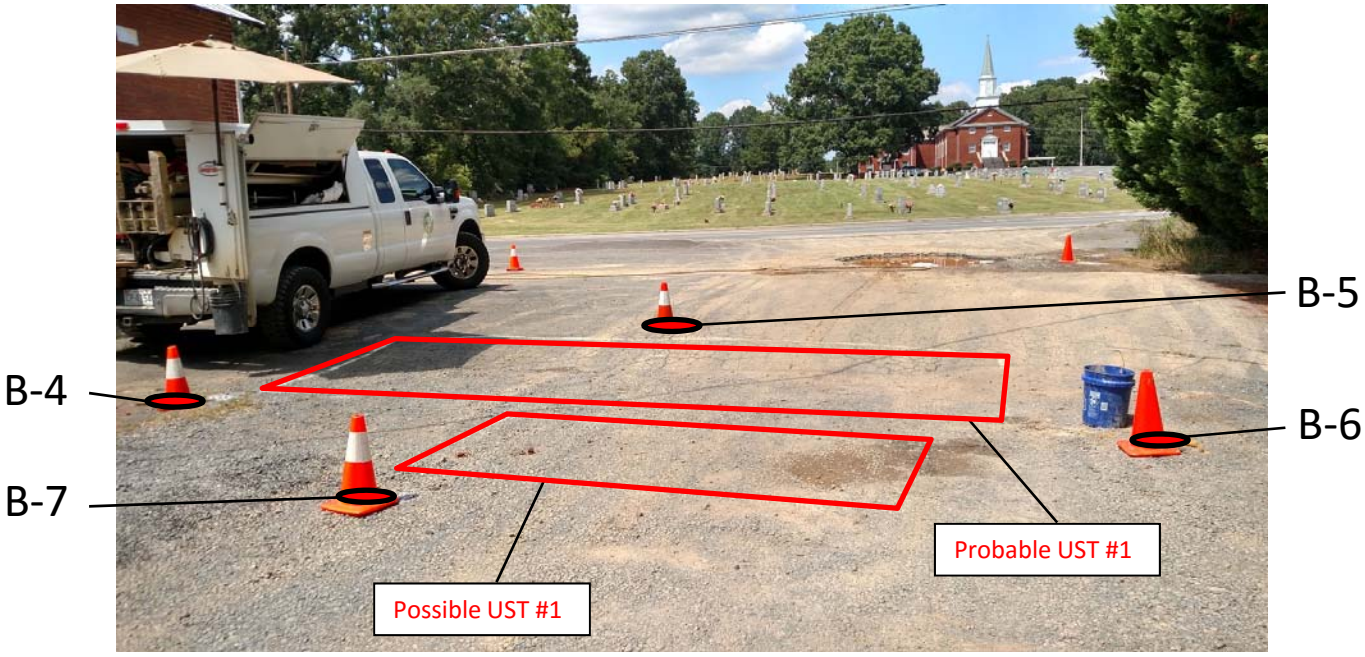


Photo #4: Boring locations B-4, B-5, B-6, B-7, surrounding the probable and possible UST, located just east of the on-site structure, facing north.

APPENDIX IV

GEOPROBE LOGS

FROEHLING & ROBERTSON, INC.

GEOPROBE LOG

Boring: P051 B-1 (1 of 1)

Project No: 66V-0092
Client: NCDOT
Project: R2530B PSAs
City/State: ALBEMARLE, NC

Elevation: EXISTING
Total Depth: 7.0'
Boring Location: SEE BORING LOCATION PLAN

Drilling Method: DIRECT PUSH
Hammer Type: Automatic
Date Drilled: 8/10/17
Driller: REGIONAL PROBING

Elevation	Depth	Description of Materials (Classification)	*Sample Depth (feet)	PID (ppm)	Remarks
		Moist Orange Brown Silty Sandy Clay			No petroleum odors observed. One sample collected for laboratory analysis (6.0-7.0)
	2.0		2.0	0.8	
	4.0	Dry Tan Silt	4.0	1.2	
	6.0	Dry Tan Silt with Gravel	6.0	4.0	
	7.0	Geoprobe Boring Terminated by Direct Push Refusal at 7 feet.	7.0	4.9	

FROEHLING & ROBERTSON, INC.

GEOPROBE LOG

Boring: P051 B-2 (1 of 1)

Project No: 66V-0092
Client: NCDOT
Project: R2530B PSAs
City/State: ALBEMARLE, NC

Elevation: EXISTING
Total Depth: 10.0'
Boring Location: SEE BORING LOCATION PLAN

Drilling Method: DIRECT PUSH
Hammer Type: Automatic
Date Drilled: 8/10/17
Driller: REGIONAL PROBING

Elevation	Depth	Description of Materials (Classification)	*Sample Depth (feet)	PID (ppm)	Remarks
		Moist Brown Silty Sandy Clay			One sample collected for laboratory analysis (2.0-4.0) No petroleum odors observed.
	2.0		2.0	4.5	
	4.0		4.0	5.5	
	6.0	Moist Brown Silty Clay	6.0	3.3	
	8.0	Moist Tan Silty Clay	8.0	4.7	
	10.0	Geoprobe Boring Terminated at 10 feet.	10.0	4.1	

GEOPROBE_LOG BORING LOGS - COPY.GPJ F&R.GDT 10/17/17

FROEHLING & ROBERTSON, INC.

GEOPROBE LOG

Boring: P051 B-3 (1 of 1)

Project No: 66V-0092
Client: NCDOT
Project: R2530B PSAs
City/State: ALBEMARLE, NC

Elevation: EXISTING
Total Depth: 10.0'
Boring Location: SEE BORING LOCATION PLAN

Drilling Method: DIRECT PUSH
Hammer Type: Automatic
Date Drilled: 8/10/17
Driller: REGIONAL PROBING

Elevation	Depth	Description of Materials (Classification)	*Sample Depth (feet)	PID (ppm)	Remarks
		Moist Brown Silty Sandy Clay			One sample collected for laboratory analysis (2.0-4.0) No petroleum odors observed.
	2.0		2.0	2.8	
	4.0	Moist to Dry Silty Sandy Clay	4.0	4.4	
	6.0	Moist Brown Silty Sandy Clay	6.0	3.8	
	8.0		8.0	4.1	
	10.0	Geoprobe Boring Terminated at 10 feet.	10.0	3.7	

GEOPROBE_LOG BORING LOGS - COPY.GPJ F&R.GDT 10/17/17

FROEHLING & ROBERTSON, INC.

GEOPROBE LOG

Boring: P051 B-4 (1 of 1)

Project No: 66V-0092
Client: NCDOT
Project: R2530B PSAs
City/State: ALBEMARLE, NC

Elevation: EXISTING
Total Depth: 11.0'
Boring Location: SEE BORING LOCATION PLAN

Drilling Method: DIRECT PUSH
Hammer Type: Automatic
Date Drilled: 8/10/17
Driller: REGIONAL PROBING

Elevation	Depth	Description of Materials (Classification)	*Sample Depth (feet)	PID (ppm)	Remarks
		Moist Brown Silty Sandy Clay			One sample collected for laboratory analysis (4.0-6.0) No petroleum odors observed.
	2.0		2.0	4.9	
	4.0	Dry Tan Silty Fine to Medium Sand	4.0	4.9	
	6.0		6.0	4.9	
	8.0	Moist Brown Silty Clay	8.0	4.0	
	10.0	Moist Orange Silty Clay	10.0	3.4	
	11.0	Geoprobe Boring Terminated by Direct Push Refusal at 11 feet.	11.0	3.3	

GEOPROBE_LOG BORING LOGS - COPY.GPJ F&R.GDT 10/17/17

FROEHLING & ROBERTSON, INC.

GEOPROBE LOG

Boring: P051 B-5 (1 of 1)

Project No: 66V-0092
Client: NCDOT
Project: R2530B PSAs
City/State: ALBEMARLE, NC

Elevation: EXISTING
Total Depth: 12.0'
Boring Location: SEE BORING LOCATION PLAN

Drilling Method: DIRECT PUSH
Hammer Type: Automatic
Date Drilled: 8/10/17
Driller: REGIONAL PROBING

Elevation	Depth	Description of Materials (Classification)	*Sample Depth (feet)	PID (ppm)	Remarks
		Moist Brown Orange Silty Sandy Clay			One sample collected for laboratory analysis (0.0-2.0) No petroleum odors observed.
	2.0		2.0	7.3	
	4.0		4.0	5.9	
	6.0	Dry Gray Silt	6.0	7.0	
	8.0	Moist Red Orange Silty Clay	8.0	6.2	
	10.0		10.0	5.6	
	12.0	Geoprobe Boring Terminated at 12 feet.	12.0	3.9	

GEOPROBE_LOG BORING LOGS - COPY.GPJ F&R.GDT 10/17/17

FROEHLING & ROBERTSON, INC.

GEOPROBE LOG

Boring: P051 B-6 (1 of 1)

Project No: 66V-0092
Client: NCDOT
Project: R2530B PSAs
City/State: ALBEMARLE, NC

Elevation: EXISTING
Total Depth: 10.0'
Boring Location: SEE BORING LOCATION PLAN

Drilling Method: DIRECT PUSH
Hammer Type: Automatic
Date Drilled: 8/10/17
Driller: REGIONAL PROBING

Elevation	Depth	Description of Materials (Classification)	*Sample Depth (feet)	PID (ppm)	Remarks
		Moist Brown Silty Sandy Clay			One sample collected for laboratory analysis (6.0-8.0) Strong petroleum odor
	2.0		2.0	3.4	
	4.0	Dry Tan Silt	4.0	4.8	
	6.0		6.0	9.5	
	8.0	Moist Orange Brown Silty Clay	8.0	21.5	
	10.0	Geoprobe Boring Terminated by Direct Push Refusal at 10 feet.	10.0	13.6	

GEOPROBE_LOG BORING LOGS - COPY.GPJ F&R.GDT 10/17/17

FROEHLING & ROBERTSON, INC.

GEOPROBE LOG

Boring: P051 B-7 (1 of 1)

Project No: 66V-0092
Client: NCDOT
Project: R2530B PSAs
City/State: ALBEMARLE, NC

Elevation: EXISTING
Total Depth: 6.0'
Boring Location: SEE BORING LOCATION PLAN

Drilling Method: DIRECT PUSH
Hammer Type: Automatic
Date Drilled: 8/10/17
Driller: REGIONAL PROBING

Elevation	Depth	Description of Materials (Classification)	*Sample Depth (feet)	PID (ppm)	Remarks
		Moist Orange Brown Sandy Silty Clay			One sample collected for laboratory analysis (2.0-4.0) No petroleum odors observed.
	2.0	Dry Brown Tan Silty Clay	2.0	3.8	
	4.0	Dry Brown Tan Silty Clay with Gravel	4.0	5.8	
	6.0	Geoprobe Boring Terminated by Direct Push Refusal at 6 feet.	6.0	2.5	

GEOPROBE_LOG BORING LOGS - COPY.GPJ F&R.GDT 10/17/17

APPENDIX V

LABORATORY ANALYTICAL RESULTS

QED

REDLAB RAPID ENVIRONMENTAL DIAGNOSTICS

QROS

Hydrocarbon Analysis Results

Client: F&R
Address: 310 HUBERT ST
RALEIGH NC

Samples taken Thursday, August 10, 2017
Samples extracted Thursday, August 10, 2017
Samples analysed Monday, August 14, 2017

Contact: BEN WHITLEY

Operator NICK HENDRIX

Project: NCDOT - R2530B - P051

U00902

Matrix	Sample ID	Dilution used	BTEX (C6 - C9)	GRO (C5 - C10)	DRO (C10 - C35)	TPH (C5 - C35)	Total Aromatics (C10-C35)	16 EPA PAHs	BaP	% Ratios			HC Fingerprint Match
										C5 - C10	C10 - C18	C18	
s	PO51 - B1 (6-7)	35.6	<0.89	<0.89	3.3	3.3	2	<0.28	<0.036	0	86.7	13.3	Deg.Fuel 73.1%,(FCM)
s	PO51 - B2 (2-4)	40.0	<1	<1	4	4	3.3	<0.32	<0.04	0	80	20	Deg Fuel 74.5%,(FCM)
s	PO51 - B3 (2-4)	40.0	<1	<1	64.1	64.1	50.4	2.5	<0.056	0	74.7	25.3	V.Deg.PHC 75.2%,(FCM),(BO),(P)
s	PO51 - B4 (4-6)	37.1	<0.93	1.1	15.2	16.3	7.5	0.38	<0.037	13.9	70.6	15.5	Deg.PHC 91%,(FCM),(P)
s	PO51 - B5 (0-2)	36.6	<0.92	<0.92	5.6	5.6	3	<0.29	<0.037	0	75.1	24.9	V.Deg.PHC 70.7%,(FCM),(P)
s	PO51 - B6 (6-8)	43.3	<1.1	16	36.8	52.8	13.3	0.5	<0.043	91.7	6.8	1.6	Deg.Diesel 61.9%,(FCM)
s	PO51 - B7 (2-4)	38.8	<0.97	2.1	12.5	14.6	10.6	0.57	<0.039	21.6	67.7	10.7	Deg Fuel 88.8%,(FCM)

Initial Calibrator QC check OK

Final FCM QC Check OK 99.4 %

Concentration values in mg/kg for soil samples and mg/L for water samples. Soil values uncorrected for moisture or stone content. Fingerprints provide a tentative hydrocarbon identification.

Abbreviations :- FCM = Results calculated using Fundamental Calibration Mode : % = confidence of hydrocarbon identification : (PFM) = Poor Fingerprint Match : (T) = Turbid : (P) = Particulate detected

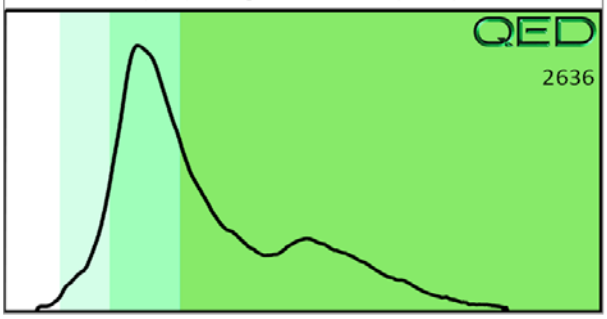
B = Blank Drift : (SBS)/(LBS) = Site Specific or Library Background Subtraction applied to result : (BO) = Background Organics detected : (OCR) = Outside cal range : (M) = Modifed Result.

% Ratios estimated aromatic carbon number proportions : HC = Hydrocarbon : PHC = Petroleum HC : FP = Fingerprint only. **Data generated by HC-1 Analyser**

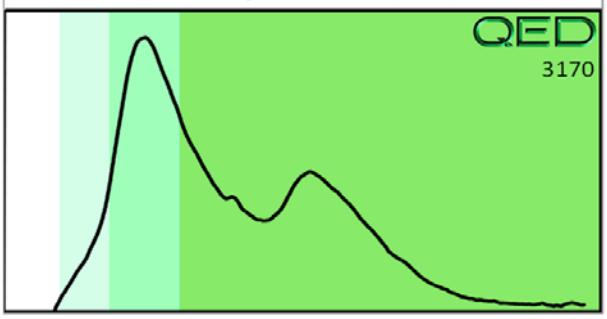
QED Hydrocarbon Fingerprints

Project: NCDOT - R2530B - P051 Monday, August 14, 2017

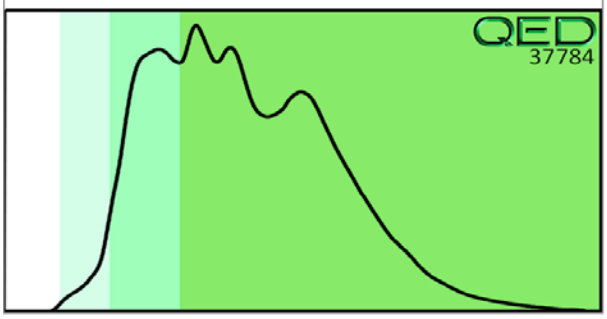
PO51 - B1 (6-7) : Deg.Fuel 73.1%,(FCM)



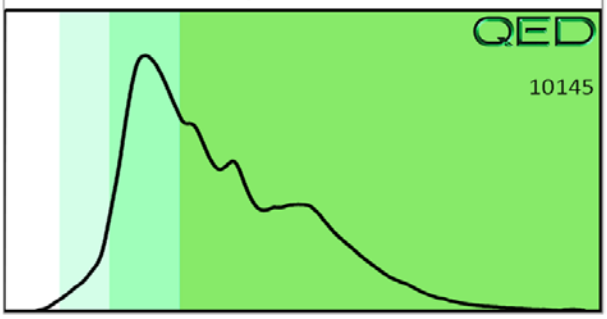
PO51 - B2 (2-4) : Deg Fuel 74.5%,(FCM)



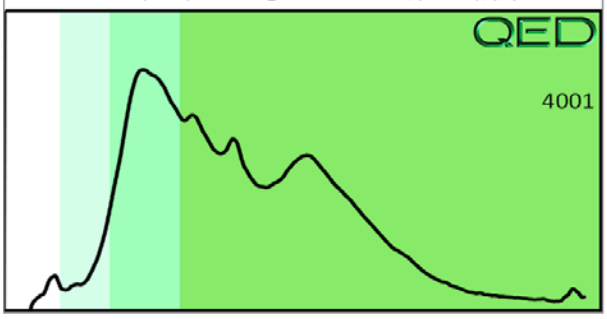
PO51 - B3 (2-4) : V.Deg.PHC 75.2%,(FCM),(BO),(P)



PO51 - B4 (4-6) : Deg.PHC 91%,(FCM),(P)

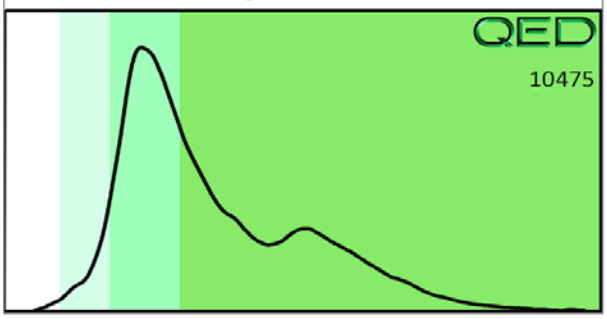


PO51 - B5 (0-2) : V.Deg.PHC 70.7%,(FCM),(P)



PO51 - B6 (6-8) : Deg.Diesel 61.9%,(FCM)

PO51 - B7 (2-4) : Deg Fuel 88.8%,(FCM)



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